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PR Docket 93-61

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

COMMENTS OF IVHS AMERICA

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SUMMARY

The Intelligent Vehicle-Highway Society of America ("IVHS AMERICA") supports the implementation of permanent rules in this proceeding to provide the more certain business environment needed by Automatic Vehicle Monitoring ("AVM") and Automatic Vehicle Identification ("AVI") interests to promote the development and deployment of their products and services.

IVHS AMERICA is a non-profit educational and scientific organization whose purpose is to coordinate and promote the research, development and deployment of intelligent vehicle-highway systems ("IVHS") in the United States. With a membership comprised of federal, state and local government, private industry, and academic interests, IVHS AMERICA is a public/private partnership and serves as a utilized Federal Advisory Committee to the U.S. Department of Transportation ("DoT").

In enacting the Intelligent Vehicle-Highway Systems Act of 1991 ("IVHS Act"), 23 U.S.C. Section 307, Congress set as a national goal the widespread implementation of an IVHS infrastructure to enhance the capacity, efficiency and safety of the Federal-aid highway system and to serve as an alternative to the construction of additional physical capacity in the highway system. Underlying enactment of the IVHS Act was the recognized demand for the development and deployment of IVHS products and services to reduce traffic congestion, improve transportation safety and promote environmental quality. IVHS products and services employ emerging communications, information and

transportation technologies to improve the safety and efficiency of use of the roadway infrastructure in the U.S.

Pursuant to the Strategic Plans developed by DoT and IVHS AMERICA as directed by the IVHS Act, the Federal Highway Administration ("FHWA") has undertaken a two stage procurement looking toward the development of a nationwide IVHS system architecture. That architecture will apply monitoring and

efficiency. To this end, IVHS AMERICA supports the adoption of rules that permit secondary, non-interfering AVI operations in any AVM allocation, and secondary, non-interfering AVM operations in any AVI allocation. IVHS AMERICA further suggests that the FCC consider establishing a six year sunset on any division of the AVM and AVI allocations. After the sunset, AVM and AVI licensees would have access on an equal basis to unlicensed spectrum throughout the 902-928 MHz band.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of)

)
Amendment of Part 90 of the)
Commission's Rules to Adopt)
Regulations for Automatic)
Vehicle Monitoring Systems)

PR Docket 93-61

COMMENTS OF IVHS AMERICA

The Intelligent Vehicle-Highway Society of America ("IVHS AMERICA" or "the Society") hereby submits its Comments on the Notice of Proposed Rule Making ("NPRM") in the above-captioned proceeding.¹ By the NPRM, the Commission proposes to modify Part 90 of its Rules to replace the interim provisions of Section 90.239 with permanent Rules governing the licensing and operation of Automatic Vehicle Monitoring ("AVM") systems in the 902-928 MHz band. The NPRM further proposes to expand the permissible operations of AVM systems to include the location of all animate and inanimate objects, and to rename the AVM service as the Location and Monitoring Service ("LMS").²

¹IVHS AMERICA relies upon its Communications Spectrum Task Force (the "Task Force") for the development of submissions to the FCC and NTIA. The Task Force is comprised of a subset of the Society's membership with expertise and interest in issues related to RF spectrum allocation policy. The Task Force was

STATEMENT OF INTEREST

Incorporated in August, 1990, IVHS AMERICA is a non-profit educational and scientific organization whose purpose is to coordinate and promote the research, development and deployment of intelligent vehicle-highway systems ("IVHS") in the United States.³ With a membership comprised of federal, state and local government, private industry, and academic interests, IVHS AMERICA is a public/private partnership and serves as a utilized Federal Advisory Committee to the U.S. Department of Transportation ("DoT").

A. The IVHS Act

In enacting the Intelligent Vehicle-Highway Systems Act of 1991 ("IVHS Act"), 23 U.S.C. Section 307, Congress set as a national goal the widespread implementation of an IVHS infrastructure to enhance the capacity, efficiency and safety of the Federal-aid highway system and to serve as an alternative to the construction of additional physical capacity in the highway system. Underlying enactment of the IVHS Act was the recognized demand for the development and deployment of IVHS products and services to reduce traffic congestion, improve transportation safety and promote environmental quality. IVHS products and services employ emerging communications, information and transportation technologies to improve the safety and efficiency of use of the roadway infrastructure in the U.S.

³The views expressed herein are those of IVHS AMERICA and are not necessarily shared by each of the individual members of the Society or the Task Force.

Through the use of Advanced Traffic Management Systems
("ATMS"). Advanced Traveler Information Svstems ("ATIS"),

development the highest priority and provided funding for that research over the next six years.⁷

B. The IVHS System Architecture Program

In the IVHS Act, Congress requested DoT to prepare a strategic plan for the development and deployment of a nationwide IVHS infrastructure in the U.S. DoT, in turn, asked IVHS AMERICA, in its capacity as a utilized Federal Advisory Committee, to prepare its own strategic plan to serve as a foundation for DoT's Congressional report. IVHS AMERICA, through its fourteen technical committees, developed a Strategic Plan to guide development and implementation over the next twenty years

⁷Operational tests have been funded pursuant to the IVHS Act in each of the IVHS functional areas through the Federal Highway Administration ("FHWA") and the Federal Transit Administration ("FTA") of DoT. These tests include, among them, the "Advanced Driver and Vehicle Advisory Navigation Concept" or "ADVANCE" project in Chicago in cooperation with the Illinois Department of Transportation, the Illinois Universities Transportation Research Consortium and Motorola, Inc. ADVANCE is a cooperative effort to evaluate the performance of the first large-scale dynamic route guidance system in the U.S. Up to 5,000 private and commercial vehicles will be equipped with in-vehicle navigation and route guidance systems. Vehicles will serve as traffic "probes," providing real-time traffic information for analysis, route selection and communication with the ADVANCE vehicles. The recently concluded Travel Technology ("TravTek") project in Orlando, Florida provided in-vehicle traffic congestion information, motorist services ("yellow pages") information, tourist information and route guidance to operators of 100 test vehicles equipped with the TravTek terminal. TravTek was a cooperative effort of FHWA, the City of Orlando, the Automobile Association of America, the Florida Department of Transportation and General Motors. Many such other IVHS operational tests are now in progress in other locations and in cooperation with numerous public sector authorities and private sector companies throughout the U.S. The universal conclusion from these tests thus far is that there is a large public demand for the benefits that widespread deployment of IVHS can provide.

of an IVHS infrastructure consistent with attaining the goals of safety, improved environmental quality and improved mobility. The IVHS AMERICA Strategic Plan was submitted to DoT in May, 1992. DoT's Congressional Report providing a road map for public sector involvement in the deployment of a nationwide IVHS infrastructure was submitted to Congress in December, 1992. Both the DoT and IVHS AMERICA Strategic Plans provide for the development of a nationwide IVHS system architecture to model the deployment of IVHS services and products throughout the U.S. The development of that IVHS system architecture is now underway.

In particular, the FHWA has undertaken a procurement looking toward the development in a two stage process of a nationwide IVHS architecture that will apply monitoring and location, communications, data management, control software and display technologies to help solve the transportation congestion, safety, and productivity problems identified in the IVHS Act. The commencement of the first phase of the IVHS system architecture program is expected before year's end. Multiple architecture contractor teams will be selected to participate in

Phase II of the system architecture program will be limited to those contractors participating in Phase I and will consist of the rigorous refinement and evaluation of each proposed architecture over nineteen months.⁸ The architectures will address the following IVHS services, among others:

1. Traveller Information
 - a. Trip planning
 - b. Traveller Advisory
 - c. Route Guidance
2. Traffic Management
 - a. Traffic Control
 - b. Incident Management
3. Freight and Fleet Management
 - a. Regulatory Support
 - b. Intermodal Terminal Operations
4. Public Transportation and Emergency Vehicle Management
 - a. Planning and Scheduling Systems
 - b. Prediction of Arrivals
5. Additional Services
 - a. MAYDAY Transmissions
 - b. HAZMAT Monitoring and Routing
 - c. Collision Avoidance

A common factor underlying the provision of these and other IVHS services is the need for reliable communications links, which in most cases will require access to adequate and suitable RF spectrum. Given these many manifestations of IVHS,

⁸See Judycki, D. and Euler, G. "The Intelligent Vehicle-Highway Systems Program in the United States" Federal Highway Administration (April 1993).

including emergency and safety applications, the FCC will play a central role in the implementation of the nationwide IVHS infrastructure.

C. Existing IVHS Services and Products

Paralleling the development of the nationwide IVHS Strategic Plan and system architecture programs has been the increasing availability today of IVHS services and products.

radios for the duration of the AHAR message.

2. Automatic Vehicle Monitoring ("AVM")

Automatic Vehicle Monitoring services identify the location of a vehicle on a periodic, or "tracking," basis. AVM services include fleet management and tracking and stolen vehicle recovery applications. Loran C, Global Positioning Satellite ("GPS") and dead reckoning techniques enable vehicle/craft operators to fix their positions. By employing a vehicle to base station communication link (e.g., cellular or SMR frequencies), the vehicle location may be communicated periodically to the fleet or traffic management center. AVM services are also offered by the wideband pulse ranging ("WRPR") multilateration

typically short range. AVI services are being increasingly deployed throughout the U.S. to meet the needs of traffic authorities and other parties to identify vehicles as they travel through certain locations. Electronic Toll and Traffic Management ("ETTM") services are a prime example of AVI. ETTM systems allow vehicles to pass through toll plazas equipped with tag readers. Vehicle operators pre-pay tolls and purchase an identifying tag. ETTM systems have been commercially deployed by the Texas Turnpike Authority on the North Dallas Tollway, by the Oklahoma Turnpike Authority in its PIKEPASS system and by the Greater New Orleans Expressway Commission on the Lake Pontchartrain Causeway, among other locations. These installed AVI systems employ a tag/reader architecture manufactured by AMTECH Corporation., an IVHS AMERICA member.

Another significant AVI service involves the collection of data by state authorities from commercial vehicles as they travel at highway speeds along key interstate highways. The states use this data to facilitate pre-clearance and bypassing of participating vehicles, eliminating delays, traffic congestion, and unnecessary work at ports of entry and weigh stations. This commercial vehicle operations ("CVO") service is deployed in seven western states that are participating in the Heavy Vehicle Electronic License Plate ("HELP") Project. These AVI systems, installed in the States of Washington, Oregon, California, Arizona, New Mexico, Texas and Utah employ, a tag/reader system

manufactured by Mark IV Industries Corporation, an IVHS AMERICA member.

Both AVM and AVI services offer great potential for providing infrastructure-level core IVHS information concerning

4. Collision Avoidance Radar

Collision avoidance radar warning systems are commercially available and are being increasingly deployed in commercial trucking and transportation applications. The first generation of these products, which are available today and have been installed, for example, in the passenger bus fleet operated by Greyhound Lines, Inc., employ warning systems to alert the vehicle operator of situations -- measured by relative speeds and distances -- that may result in collisions.¹¹ Ultimately, collision detection radars, or other IVHS technologies, may be used to control vehicle steering and braking systems.

Other emerging IVHS products and services include in-vehicle information systems, microcomputer-based navigation and route guidance, traveler information kiosks, variable message signs, weigh-in-motion ("WIM") systems and a host of other applications involving distributed intelligence throughout the nation's transportation networks.

In short, IVHS is an increasing reality in everyday life. As these and other IVHS services and products continue to mature, and as the IVHS system architecture selection program progresses, there will be an ever increasing public awareness of IVHS, and a growing need for IVHS to access adequate and suitable

¹¹VORAD Safety Systems, Inc., an IVHS AMERICA member, manufactures the VORAD collision avoidance radar that is deployed in the Greyhound Fleet.

RF spectrum.¹² IVHS AMERICA thus commends the FCC for its recognition in this proceeding of the benefits of IVHS and of the Congressional mandate of the IVHS Act. See NPRM at para. 1, n. 2.

COMMENTS ON NPRM

By its NPRM, the Commission proposes to implement permanent rules governing the licensing and operation of LMS systems in the 902-928 MHz band. This proceeding is responsive to a Petition For Rulemaking (RM-8013) submitted by PacTel Teletrac requesting that the Commission revisit the interim provisions of Section 90.239 of its Rules governing AVM systems in the 900 MHz band.

The Commission adopted the rules by unanimous vote of

development, the rule changes being adopted are necessarily only interim provisions...." The Commission indicated its intent to closely study data gathered from the operation of 900 MHz AVM systems, including vehicle location accuracy, frequency requirements, system capacity, compatibility with existing operations "and other like elements of efficiency in operation."¹³

Subsequent to the AVL Order, the Commission has licensed both AVI and AVM systems throughout the 902-928 MHz band. By its Petition For Rulemaking, PacTel Teletrac requested, inter alia, that the Commission adopt permanent rules for AVM systems in the 900 MHz band to minimize interference between AVM and AVI systems. To this end, PacTel Teletrac requested the promulgation of permanent rules providing AVM licensees co-channel protected areas defined by a fifty mile radius from either the center of a major urbanized area or the coordinates designated by the licensee for non-urbanized areas. See PacTel Teletrac Petition For Rulemaking (May 26, 1992) ("PacTel Petition") at 31. PacTel supported the grandfathering of existing AVI systems licensed in the 904-912 and 918-926 MHz bands as of the date of filing of its Petition. PacTel Petition at 36.

¹³At the time the AVL Order was adopted the term "Automatic Vehicle Monitoring" or "AVM" generally encompassed both AVM (multilateration) and AVI (proximity sensing) services. The use of the term "AVM" in Section 90.239 of the Rules thus refers generally to both AVM and AVI services.

IVHS AMERICA believes that the timely deployment of both AVM and AVI services in a manner that enhances the public's understanding of, and comfort with, IVHS generally will substantially contribute to the early realization of the many public benefits of IVHS. The widespread deployment of AVM and AVI systems, moreover, will increase the availability of information concerning public demand for IVHS and enhance the IVHS community's understanding of that demand. IVHS AMERICA thus

remains committed to the development of IVHS systems that will

in the 902-928 MHz band and urges the Commission to assign the expeditious resolution of the issues in this proceeding the highest priority. Given the accelerating pace of deployment of AVM and AVI services, it is incumbent upon the IVHS community to address and resolve these issues now.

IVHS AMERICA recognizes that the adoption of permanent rules with a more definitive allocation scheme requires that the FCC evaluate, among others, the factors enumerated in its AVL Order, including frequency requirements, the substantiated relative levels of demand for AVM and AVI services, expected system capacity and compatibility and other "like" measures of efficiency. Any decision by the Commission on a division of the 902-928 MHz allocation between AVM and AVI services will require an evaluation of these factors and of the full record compiled in response to the NPRM. In the Society's view, however, because AVM and AVI services and technologies are still emerging, any permanent rules adopted by the Commission in this proceeding should incorporate substantial flexibility to permit AVM and AVI licensees to adapt their operations to maximize their use of the available spectrum for IVHS services. IVHS AMERICA thus urges the Commission to adopt permanent rules consistent with the following four principles.

1. The Permanent Rules Should Promote The Deployment Of
AVM and AVI Systems And Favor The Provision Of IVHS Services

In its AVL Order, the Commission made clear its intent to promote the development and deployment of vehicular location and monitoring services in the 902-928 MHz band. In its NPRM, the FCC has proposed to expand the scope of permissible AVM operations to include as LMS operations the location of all animate and inanimate objects.

IVHS AMERICA recognizes that the provision of non-vehicular location and monitoring services in the 902-928 MHz band may include many worthy functions, such as personal locator or in-plant automatic equipment identification services. However, the fundamental purpose of this proceeding, as well as the earlier AVL Order, is to promote the deployment of vehicular (or intermodal transportation) monitoring and location services. Because the 902-928 MHz AVM allocation has served for almost twenty years principally vehicular operations and because the record is clear that the demand for vehicular-based monitoring and identification services (and similar location and monitoring services in intermodal transportation applications) is substantial and growing, the Society urges the Commission to assign a higher spectrum access priority to AVM and AVI operations than to other, more general location and monitoring functions.

To this end, applicants seeking licenses in that portion of the 902-928 MHz band assigned to AVM services should

certify that "Applicant proposes to construct and place in operation an Automatic Vehicle (or Intermodal Transportation) Monitoring system." Applicants who can not make this certification should certify that "Applicant proposes to construct and place in operation a non-vehicular Location and Monitoring System and acknowledges that such operations shall be secondary to any prior or subsequent co-channel Automatic Vehicle Monitoring systems." Licensees obtaining an AVM license should be permitted to provide on an ancillary basis non-vehicular monitoring services on their facilities.

Similarly, applicants seeking licenses in that portion of the 902-928 MHz band assigned to AVI services should certify that "Applicant proposes to construct and place in operation an Automatic Vehicle (or Intermodal Transportation) Identification system." Applicants that can not make this certification should certify that "Applicant proposes to construct and place in operation a non-vehicular Location and Monitoring system and acknowledges that such operations shall be secondary to any prior or subsequent co-channel Automatic Vehicle Identification systems." Licensees obtaining an AVI license should be permitted to provide on an ancillary basis non-vehicular identification services.

2. The Permanent Rules Should Protect Existing Systems

Public acceptance of IVHS services and products is essential to the successful deployment of an IVHS infrastructure. The public's perception of the operation of existing first generation IVHS systems, including the AVM and AVI systems in the 900 MHz band, is of special importance. To this end, the existing AVM and AVI operational systems should be protected to the maximum extent possible from interfering uses.

The adoption of permanent rules that require the disruption or dislocation of existing operations may impair the public's acceptance of IVHS. Accordingly, IVHS AMERICA urges the Commission to view the dislocation of existing AVI or AVM systems only as an alternative of last resort. At a minimum, no AVI system should be required to migrate until such date as a co-channel AVM system is constructed and commences operation within its service area. In addition, IVHS AMERICA supports the consideration by the FCC of the grandfathering of existing AVI readers that have been constructed and now provide service (as of June 29, 1993) in that portion of the 902-928 MHz band proposed for allocation to wideband systems. In these circumstances, the Society is hopeful that co-channel AVM and AVI licensees would cooperate to eliminate harmful interference between the systems. In the event that the permanent rules or sound interference management dictate the migration of a constructed system, IVHS AMERICA is also hopeful that the costs of dislocation will be

apportioned fairly between the subject licensees and that those costs will not be borne by the public.

3. The Permanent Rules Should Promote The Expeditious Deployment Of AVM and AVI Systems

IVHS AMERICA concurs with the Commission that the public interest will be served by the adoption of reasonable near term construction requirements that provide AVM and AVI licensees the incentive to expeditiously deploy their systems. Clearly, only parochial interests will be served by the indefinite warehousing of AVM or AVI licenses.

The Society urges the Commission to indicate its receptivity, however, to more extended construction periods in special circumstances. For example, IVHS AMERICA is aware that the procurement process of state and local transportation authorities in coordinating the purchase and installation of ETSM systems may unavoidably consume more than the proposed eight month construction period. Yet, in the Society's view, the public interest clearly will be well served by providing those authorities an extended construction schedule subject to reasonable benchmarks to implement a multi-jurisdiction compatible system.

4. The Permanent Rules Should Promote Spectrum Efficiency

In its NPRM, the FCC has noted that the allocation scheme of the 902-928 MHz band mandates a spectrum sharing hierarchy which accords Government usage and Industrial,